Environmental Assessment /
Finding of No Significant Impact

MIRROR LAKE LOOP TRAIL RECONSTRUCTION

September 28, 1998

YOSEMITE NATIONAL PARK
CALIFORNIA

UNITED STATES DEPARTMENT OF THE INTERIOR • NATIONAL PARK SERVICE

United States Department of the Interior

NATIONAL PARK SERVICE
P.O. Box 577
Yosemite National Park, California 95389

IN REPLY REFER TO:
D30 (YOSE)

Finding of No Significant Impact
Mirror Lake Loop Trail Reconstruction
Yosemite National Park, California

I. Purpose and Need

The National Park Service (NPS) proposes to reconstruct with improvements and/or relocate approximately one mile of trail on the Mirror Lake Loop Trail at the eastern edge of Yosemite Valley, Yosemite National Park (YNP), Mariposa County, California. The proposed action will restore a maintained trail around Mirror Lake and lower Tenaya Canyon. This action is needed because a 1,300-foot section of the Mirror Lake Loop Trail was completely lost during the flooding. Accelerated erosion and the rerouting of Tenaya Creek channels resulted in approximately 4,000 feet of trail being either washed out, heavily deposited or in need of a slightly elevated trail to remain passable during spring runoff. The upper Tenaya Creek Bridge, lower Tenaya Creek Bridge and Snow Creek Bridge were damaged, destroyed or rendered useless when Tenaya Creek over-topped its banks and flooded during January 1-3, 1997. The bridges will be reconstructed, removed or relocated in order to facilitate crossing the Tenaya Creek channels. The improved trail will be consistent with the Concession Services Plan; and minimize the environmental effects associated with the high use of the Mirror Lake Area.

II. Anticipated Environmental Effects and Mitigation

There would be no major adverse impacts to biotic communities. Abutments would be removed and/or constructed during low flow periods to minimize impacts to Tenaya and Snow Creeks. Trail reroutes would not cause any significant long-term impacts. Minor impacts from annual routine maintenance would continue to occur, but these impacts would be less than would occur under no action. There would be short-term impacts to vegetation associated with the gathering of rock in the project area to supplement materials hauled in for construction.

There would be no new impacts to wetlands. Current adverse impacts to wetlands would be minimized. Due to improvements and the resulting decreased chance of saturation, trail traffic and associated impacts would more likely be contained within trail boundaries (preventing impacts to adjoining wetlands). It is anticipated that an improved trail will seldom need to be closed due to saturation.

There would be no adverse impacts to special status species. Implementing blasting restrictions reduces short-term seasonal impacts to the species mentioned below. The majority of project blasting would occur at the eastern extent of the project area. There are no anticipated long-term impacts to special status species associated with this project.

The improved trail sections would not be as susceptible to closures, damage and destruction from annual runoff. Therefore, park staff would not have to annually reconstruct and repair trail sections. Additionally, it would be less likely that the trail would be closed due to saturated conditions. Protection rangers would not have to enforce annual closures, and therefore, could spend time protecting other park resources.

Mitigation Measures: The following mitigation measures were analyzed in the Environmental Assessment (EA) and were developed to reduce the foreseeable and potential anticipated environmental effects of the proposed action. The implementation of and adherence to these mitigation measures is the responsibility of the National Park Service.

To minimize waste and pollution:	Temporary impacts associated with trail construction would occur, such as soil and vegetation disturbance and the possibility of soil erosion into Tenaya Creek. Standard erosion control and prevention measures such as silt fences and sand bags could be used to minimize potential soil erosion.
	Erosion control devices would be inspected weekly or after every major storm. Accumulated sediments would be removed when necessary. Silt removal would be accomplished in such a way as to avoid introduction into any wetlands or flowing water bodies.
	The use of a "Bobcat" (small front end loader) would be allowed in the construction area. It is possible that petrochemicals from this equipment could seep into the soil and water. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks and each machine would have a clean up and spill containment kit on board. Also the undercarriage would be inspected and cleaned as necessary to prevent importing non-native plant materials.
	All blasting would conform with the 1991 NPS-65 (*Explosives Use and Blasting Program*) specifications. All blasting would use the minimum amount necessary to accomplish the task.
	For the lower Tenaya Creek Bridge #24, the remains of the bridge abutments would be removed. All mechanical work to remove the damaged abutments would be conducted from the creek banks and during times of low flow. No equipment would be allowed below the ordinary high water mark or in the creek itself.
	Throughout all aspects of the project, Tenaya and Snow Creek water quality would be maintained at or above minimum levels required by the State of California Water Quality Control Board.
To minimize impacts to vegetation:	Prior to trail construction, Resource Management Staff will work with the Trail Crew Leader to identify and initiate plant salvage to be used as revegetation material once trail construction is complete. Revegetation efforts would be to recreate the natural spacing, abundance, and diversity of native plant species. During project implementation and upon completion of the project a Natural Resource Specialist from the Office of Flood Recovery will inspect the area to assess ongoing and completed revegetation and restoration efforts.
	Bobcat will be pre inspected for exotic weed on treads, undercarriage etc.
	Following soil disturbance, areas would be monitored for non-native species (especially blackberry and bull thistle) which would be removed.
To protect cultural resources:	If previously undiscovered cultural resources are found, every effort would be made to avoid these newly discovered resources. Should avoidance prove impossible, data recovery measures would be initiated using the approved Yosemite Archeological Synthesis and Research Design, and the Recovery Archaeologist would consult with the American Indian Council of Mariposa County.
To comply with applicable laws:	The U.S. Army Corps of Engineers (COE, Sacramento, California) has been consulted (December 23, 1997) regarding work on both Tenaya Creek Bridges. For the upper Tenaya Creek Bridge #25 the project proposal consists of removing and rebuilding the north abutment and rebuilding the bridge to repair the bridge to pre-flood conditions. The rebuilt north abutment would not be in the channel. The work to reconstruct the upper Tenaya Creek Bridge requires citation of COE Nationwide Permit #3 *Maintenance*. Work to relocate the Snow Creek Bridge #26 also falls under this permit.
	Reconstruction of the Mirror Lake Trail is authorized under COE Permit section 323.4, Discharges Not Requiring Permits, 33 CFR, Federal Register, November 13, 1986 (Larry Vinzant, Chief, San Joaquin Valley Office, COE, Sacramento, CA March 4, 1998). Mr. Vinzant stated that examination of the area under high water conditions was a valid determination to make an exemption from the one-year rule under which the regulations are usually valid. Mr. Vinzant stated that 323.4 emphasized rebuilding in same location with "minor modification" to elevation and location and that adding a "few" culverts to facilitate drainage and protect the trail and its investment would be within the regulations of 323.4.
	This project also requires compliance with General Condition 9 (water quality, Section 401 of the Clean Water Act) of the COE Nationwide Permit process. Section 401 certification or waiver of certification will be obtained through the California Regional Water Quality Control Board prior to construction.
	All permits would be obtained prior to initiating work on the Tenaya Creek Bridges.

III. Public Review

The EA was released on August 28, 1998 for public and agency comment ending on September 15, 1998. In addition to the proposed action, the NPS presented the no action alternative that reconstructed the trail to pre-flood conditions. Several alternatives were considered and rejected including building the trail in the pristine talus slopes above the project site, building a wooden boardwalk instead of the proposed elevated causeway or completely removing the trail. The NPS coordinated with the Army Corps of Engineers, the Regional Water Quality Control Board and the U.S. Fish and Wildlife Service while preparing the EA. Yosemite distributed about 300 copies of the EA to the public, government agencies, and interest groups. In addition, the NPS mailed copies of the EA to five individuals who subsequently requested it. A press release was issued to local and regional papers, agencies, and interest groups as well as national wire services. Four comments were received regarding this project. None of the comments raised significant issues or concerns not addressed in the EA. A summary of the comments and responses to comments is provided below.

- **Comment:** Three comments were received in support of the project, and one of those comments expressed preference for closing the trail to stock use.

  Response: The Concession Services Plan (CSP) and corresponding Environmental Impact Statement (EIS) limits horseback riding routes in Yosemite Valley to the eastern end and southern side of the valley (page 13). The Mirror Lake Loop Trail is essentially the only trail in this area suitable for concession stock use. Stock use is encouraged in this area to reduce the potential conflicts between horses and visitors in other heavily used areas of Yosemite Valley. Closing the trail to such use is not consistent with CSP/EIS and the resulting concession service contract.

- **Comment:** One comment expressed concern about the construction of elevated walled causeways and a raised wooden walkway.

  Response: The boardwalk alternative that included construction of a raised wooden walkway was dismissed, a wooden walkway will not be constructed. The NPS has determined that elevated walled causeways are the most appropriate construction design to accommodate current stock use and normal weather conditions. The elevated causeway lengths proposed in the EA are maximums and will vary depending on site conditions.

IV. Finding

Based on the analysis in the EA, the ability of the mitigation measures to eliminate or minimize impacts, and with due consideration of public comment, the NPS has determined that the proposed action does not constitute a major federal action significantly affecting the quality of the human environment. Neither wetlands nor floodplains are adversely effected; there are also no cumulative or indirect effects. Thus, an EIS will not be prepared and the proposed action will be implemented.

Recommended: _____ 9/28/98
Superintendent, Yosemite National Park — Date

Approved: _____ 9/28/98
Regional Director, Pacific West Region — Date

United States Department of the Interior

NATIONAL PARK SERVICE
YOSEMITE NATIONAL PARK
P.O. BOX 577
YOSEMITE NATIONAL PARK, CALIFORNIA 95389

IN REPLY REFER TO:

L7617

AUG 2 7 1998

Dear Friends of Yosemite:

The National Park Service, Office of Flood Recovery, has completed an Environmental Assessment (EA) for the Mirror Lake Loop Trail Reconstruction project. Portions of the Mirror Lake Loop Trail were damaged or destroyed in the January 1997 flood, the loop has been closed to the public ever since. The work proposed in this EA would allow the entire loop trail to be reopened for public use. The proposed action includes reconstructing and slightly elevating the existing Mirror Lake Loop Trail in its original pre-flood alignment. Two trail sections that were severely damaged during the flood would be rerouted. The proposed action also calls for the replacement, repair or removal of three trail bridges.

Enclosed is a copy of the EA, public comments will be collected until September 15, 1998. The National Park Service encourages your participation in all Yosemite National Park planning activities. A copy of the decision on this project will be distributed to those who submit comments and to those who specifically request a written copy. Please send your written comments to:

National Park Service
Superintendent
PO Box 577
Yosemite National Park, CA 95389
Attn: EA- Mirror Lake Loop Trail

Sincerely,

for Stanley T. Albright
Superintendent

Enclosure

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1.0 PURPOSE AND NEED

The National Park Service (NPS) proposes to reconstruct with improvements approximately one mile of trail on the Mirror Lake Loop Trail at the eastern edge of Yosemite Valley, Yosemite National Park, Mariposa County, California (see Project Location Map p. 2). The proposed action would restore a maintained trail around Mirror Lake and lower Tenaya Canyon; improve the trail to reduce the likelihood of major annual trail repair; facilitate use of the area consistent with the Concession Services Plan; and minimize the environmental effects associated with the high use of the Mirror Lake area.

The greater Mirror Lake area is the fourth most visited area in the park. The Mirror Lake Loop Trail provides access into the area as well as the adjacent wilderness. The northwest portion of the Mirror Lake area is managed and interpreted as a Cultural Landscape by the NPS. The primary purpose of Cultural Landscapes is to preserve and interpret natural and cultural resources.

Flooding resulted in the accelerated erosion and rerouting of the Tenaya and Snow Creek channels. Approximately one mile of trail is washed out, heavily deposited or in need of slight elevation to remain passable during spring runoff. A 1,300-foot section of the Mirror Lake Loop Trail that was completely lost and a 641-foot section near Snow Creek will be relocated. The upper Tenaya Creek Bridge #25, lower Tenaya Creek Bridge #24 and Snow Creek Bridge #26 were damaged, destroyed or rendered useless when Tenaya and Snow Creeks over-topped their banks and flooded. The bridges will be reconstructed, removed or relocated to facilitate crossing the Tenaya and Snow Creek channels.

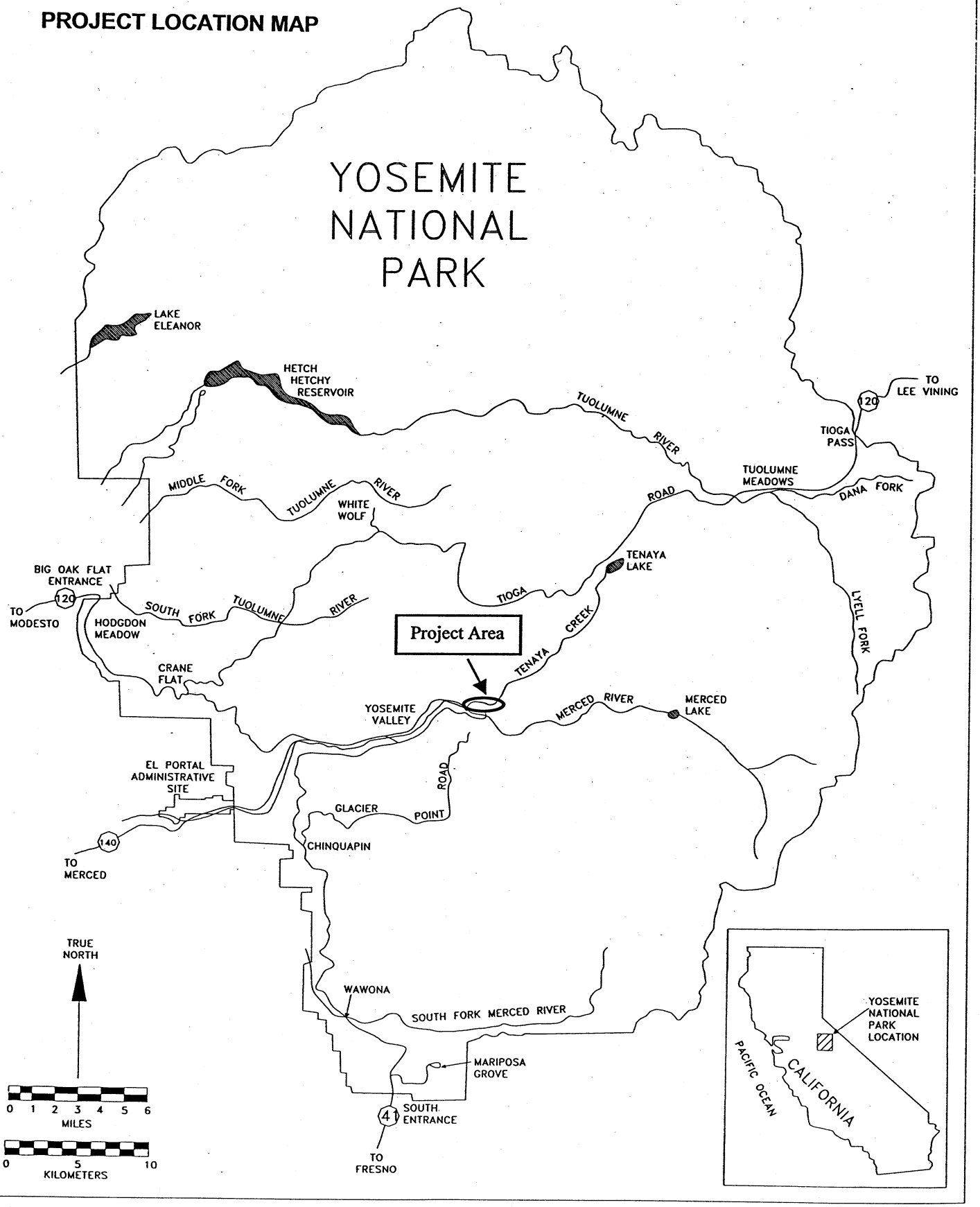
2.0 BACKGROUND AND PREVIOUS PLANNING

2.1 Background and Site Significance

Mirror Lake Loop Trail is located at the east end of Yosemite Valley in lower Tenaya Canyon at an elevation of approximately 4,000 feet. Mirror Lake is about one mile upstream from the confluence of Tenaya Creek and the Merced River. The loop trail is located below the northwest Face of Half Dome, its banks provide outstanding views of Half Dome, Mt. Watkins, Clouds Rest, Washington's Column, Snow Creek, and several other Yosemite Valley and Tenaya Canyon features.

The vistas of Half Dome, Mt. Watkins, and other features of Tenaya Canyon, reflected in the Mirror Lake's waters, have long been recognized for their exquisite visual qualities. In as much, it has been a popular visitor destination since the 1860's. Mirror Lake's popularity was enhanced when access was improved with carriage and automobile roads extended to its western shores. Mirror Lake Loop Trail has become the portal into the wilderness of Tenaya Canyon.

PROJECT LOCATION MAP



The Tenaya Canyon is narrow with a substantial drop in elevation over a relatively short distance. The canyon accelerates and sustains large, fast debris flows. These flows consist of rock, sand and organic material that periodically change the drainage patterns and alter the local topography by moving substantial amounts of heavy material as evidenced by the January 1997 flood. The Tenaya Creek watershed is naturally sand laden, as can be observed in stream channels in the upper watershed. Most of the flow is deposited upstream of Mirror Lake when the water begins to slow down, thus dropping its suspended load. As a result, the upper Mirror Lake pool is dynamic and subject to rapid sedimentation.

In the past, maintenance work along the Mirror Lake Loop Trail has resulted from debris flows, rockslides and heavy concessionaire stock use on the trail when the trail is saturated. In the years between 1980 and 1983 concerted efforts were made to provide a solid (even when wet) trail to confine impacts to the trail and out of the wetter areas. Rock was hauled in and crushed to provide a stable, compact trail tread. The crushed rock was then covered with soil and sand. Some sand was washed away in the January 1997 flood, some had been worn away by use before the flood, and more sand was deposited on or near the trail during the flood. The rock that was placed to establish the trail prism still remains.

2.2 Relationship with Other Plans

The approved 1980 *General Management Plan* (GMP) addresses various needs related to resource management and protection as well as providing quality facilities for visitor use. The GMP goals are supported by the 1996 *Resource Management Plan*, and the 1997 Draft *Valley Implementation Plan* (VIP).

An Environmental Assessment (EA) dated May, 1996 (Finding Of No Significant Impact signed August 22, 1996) for the Mirror Lake area proposed to restore, manage and interpret Mirror Lake as a Cultural Landscape. The approved action proposed the following: 1) install two public restrooms at the lower carriage road intersection northeast of the shuttle bus stop; 2) build an accessible interpretive trail; 3) remove obsolete roads; 4) restore areas with native vegetation; and 5) restore to adapted use a historic transportation corridor at Mirror Lake including the reconstruction of a historic footbridge. A majority of this work was completed before the January 1997 flood.

The No Action and Proposed Action Alternatives presented in this Mirror Lake Loop Trail Reroute EA are consistent with the administrative direction for resource management and visitor use as presented in the 1980 GMP, 1997 Draft VIP, 1996 Mirror Lake EA, 1996 *Resource Management Plan* and Flood Recovery *Detailed Assessment Report*, 1997. Actions called for under these approved plans as well as maintenance activities (including routine trail maintenance) would continue regardless of decisions stemming from this document.

3.0 SCOPE OF DOCUMENT

In accordance with the National Environmental Policy Act (NEPA) and NPS Management Policies, this EA has been prepared to assess potential environmental impacts from the proposed improvements to the Mirror Lake Loop Trail. This EA identifies, evaluates, and documents the potential effects of trail reconstruction and/or rerouting and bridge repair, removal, and/or replacement. The existing conditions prior to January 1997 flooding constitute the baseline for the effects of the proposed action. The baseline condition reflects the restoration of a maintained trail similar to what existed prior to January 1997.

3.1 Impact Topics Included in this Document

An interdisciplinary team of planners, scientists, natural and cultural resource specialists, park management, and maintenance personnel analyzed the proposed action against pre-flood conditions and identified the relevant beneficial and adverse impacts associated with the action. In order to assess the full range of potential impacts, the following topics have been evaluated:

- **Biotic Communities**
- **Wetlands**
- **Special Status Species (Threatened, Endangered, Proposed and Rare Species)**
- **Park Operations**

3.2 Impact Topics Dismissed in this Document

The alternatives would have little or no effect on the following topics. Justification for dismissing these topics is provided below.

3.2.1 Air Quality: Should either alternative be selected, local air quality would be temporarily effected by construction generated dust. There may be a slight and temporary degradation of local air quality due to dust generated from construction activities and equipment. These effects would last only as long as construction activities occurred and the park's Class I air quality would not be effected by the proposal. Therefore, air quality was dismissed as an impact topic.

3.2.2 Cultural Resources: The 1966 National Historic Preservation Act (16 USC 470 et seq.), NEPA, 1916 NPS Organic Act, 1988 NPS *Management Policies*, NPS-2 (*Planning Process Guideline*), and NPS-28 (*Cultural Resource Management*) guidelines require the consideration of impacts on cultural resources.

The proposed project area was inventoried for cultural resources by Caputo in

1997. Beside the trail being historic, one prehistoric site (CA-MRP-1356) is located near the area of proposed work (Section O, see p. 15). Subsurface surveys of this site and project area resulted in no additional cultural resources being located (Vittands 1998). Proposed trail construction work in the area would be monitored for cultural resources. Section 106 compliance for the subject action was completed according to the flood recovery protocols agreed to by the California State Historic Preservation Officer and Advisory Council on Historic Preservation. Since cultural resources will not be affected by the proposed undertaking, it was dismissed as an impact topic in this document.

3.2.3 Environmental Justice: Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Neither alternative would have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Therefore, Environmental Justice was dismissed as an impact topic.

3.2.4 Floodplains: Executive Order 11988 (Floodplain Management) requires the NPS and other agencies to evaluate the likely impacts of actions in floodplains. If either alternative is selected, the damaged trail section will be rebuilt within the 100-year floodplain. However, the Mirror Lake area is closed to overnight camping and no overnight occupation is allowed; therefore, this type of action would not have an adverse impact on the floodplain and its associated values. As such, in compliance with NPS *Floodplain Management Guideline* (1993, V, B Excepted Actions) development of this trail as described in both alternatives is exempt from Executive Order 11988 (Floodplain Management). Floodplains were dismissed as an impact topic.

3.2.5 Prime and Unique Farmland: In August, 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil which particularly produces general crops such as common foods, forage, fiber, and oil seed. Unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the Natural Resource Conservation Service, there are no prime farmlands associated with the project area. Therefore, the topic of prime and unique farmland was dismissed as an impact topic.

3.2.6 Scenic and Recreational Values: Conserving the scenery of national

park units is a fundamental purpose of the 1916 NPS Organic Act. Providing for visitor enjoyment is one of the elemental purposes of the NPS according to the Organic Act. The 1980 GMP and the 1997 Draft VIP establish provisions for recreational uses by providing quality facilities for a more meaningful visitor experience. Both alternatives would maintain the Mirror Lake Loop Trail and perpetuate the scenic and recreational values of the Mirror Lake area. Therefore, scenic and recreational values will not be addressed as an impact topic.

3.2.7 Socioeconomic Values: Socioeconomic values consist of local and regional businesses and residents, the local and regional economy, and park concessions. The local economy and most business of the communities surrounding the park are based on professional services, construction, tourist sales and services, and educational research; the regional economy is strongly influenced by tourist activity. The 1980 GMP discussed the socioeconomic environment and impacts extensively.

Local and Regional Economy: Should either of the alternatives be implemented, short-term economic benefits from construction related expenditures and employment would include economic gains for some local and regional businesses and individuals. Possible disturbance and inconvenience to park visitors from construction activities would be temporary and only occur during the construction period.

Park Businesses: It is not anticipated that businesses within the park would experience any appreciable adverse short-or long-term economic impacts should either of the alternatives be implemented.

There would be short-term benefits to the local and regional economy; local and regional businesses would not be appreciably affected in the long-term. Therefore, socioeconomic values were dismissed as an impact topic.

3.2.8 Wilderness: As part of the California Wilderness Act of 1984, Congress designated 94.2% of the park (704,624 acres) as wilderness and 1.5% (927 acres) as potential wilderness additions. A portion of wilderness boundary is within approximately 100 feet of the project site; the wilderness boundary begins at the 4,200-foot contour line above Mirror Lake. Although some construction work would be near the wilderness boundary, wilderness lands would be avoided during construction activities. Although there would be some noise generated by construction activities near the wilderness boundary, the noise would travel into the peripheral area of the wilderness area and would last only as long as construction takes place. There would be no adverse consequences to wilderness lands, no long-term adverse consequences to wilderness values or solitude, and no major visual changes to the landscape should the proposal be selected. Wilderness was dismissed as an impact topic.

4.0 ALTERNATIVES

This section describes two management options for the Mirror Lake Loop Trail as well as the alternatives considered and dismissed for the area. These alternatives were developed to resolve visitor use and park management issues. No Action reflects the restoration of a maintained trail similar to what existed prior to January 1997. It does not imply or direct discontinuing the pre-flood condition or removing existing uses, developments or facilities. No Action provides a basis for comparing the management direction and environmental consequences of alternative actions. The Proposed Action is the NPS preferred alternative and it optimizes use of the area in terms of resource protection and management, visitor and operational use, costs, and other applicable factors. A summary table comparing No Action and the Proposed Action is presented near the end of this section in the Alternative Comparison Table (p. 13-15).

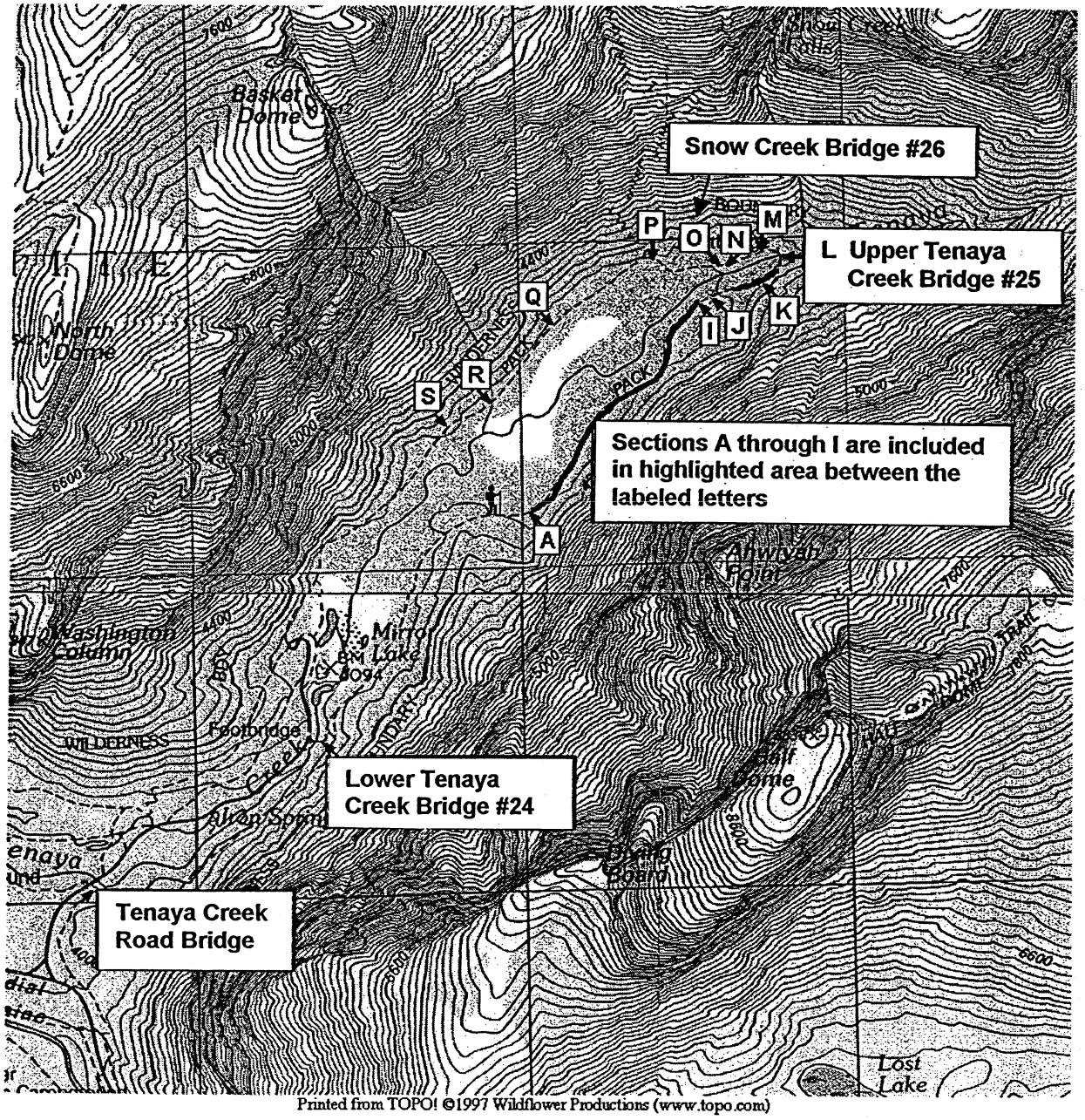
4.1 Alternative A – No Action

Under this alternative, sections A through I (see project map p. 8 and table p. 13-15) of the Mirror Lake Loop Trail that were severely eroded would be minimally repaired without major improvements to the damaged sections. This would restore the Mirror Lake Loop Trail to pre-flood conditions (suitable for stock use). These trail repairs may not be strong enough to withstand annual typical spring runoff from Tenaya Creek (as is presently the case) and would require extensive annual rehabilitation. The trail is not and would not be used as often as an improved trail would be used due to annual saturated conditions. These repairs include two reroutes in areas where the trail was completely washed out and is no longer usable.

The damage to section K likely resulted from waters deflecting off the north abutment of the upper Tenaya Creek Bridge #25 and being redirected onto the south bank, causing severe erosion. This hydrologic force eventually removed enough of the bank to eliminate the trail for approximately 1,300 feet. Much of the eroded bank material can be seen deposited on the north bank directly downstream from the erosion scar. The missing trail section would be rerouted under No Action to maintain the Mirror Lake Loop.

To restore the trail to pre-flood conditions, the north abutment of the upper Tenaya Creek Bridge #25 would be blasted by controlled explosive charges and the bridge would be replaced. The replacement bridge would be approximately 70 feet long and 8 feet wide. This would extend the span of the destroyed bridge by approximately 15 feet to allow the north abutment to be constructed farther from the creek so a greater volume of water could flow through the area. The bridge would be constructed with steel beams and pressure treated lumber.

PROJECT MAP


Snow Creek Bridge #26
L Upper Tenaya Creek Bridge #25
Sections A through I are included in highlighted area between the labeled letters
Lower Tenaya Creek Bridge #24
Tenaya Creek Road Bridge
Basket Dome
North Dome
Washington Column
Mirror Lake
Footbridge
Half Dome
Lost Lake
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Due to flood caused changes in Snow Creek, the Snow Creek Bridge #26 would be reconstructed along a newly rerouted trail. The old Snow Creek Bridge would be removed and the area restored to natural conditions. The lower Tenaya Creek Bridge #24 was completely destroyed during the flood. There are no suitable sites or structurally sound banks upon which to reconstruct this bridge. Therefore, the lower Tenaya Creek Bridge #24 would not be replaced. Trail users wishing to cross Tenaya Creek near this area would have to use the Tenaya Creek road bridge approximately one half mile downstream. Wayfinding signs would be placed to direct trail users to the road bridge. This new route still provides a "loop"; however, it is slightly longer than the pre-flood Mirror Lake Loop.

4.2 Alternative B - Proposed Action

The proposed action would improve the trail so that it can withstand more substantial highwater events and eliminate the need for extensive annual trail maintenance. The proposed action also would increase the time that the trail is usable because the improvements would reduce saturated conditions. The proposed alternative consists of raised trail causeway, trail reroutes, bridge replacement and bridge abutment removal. These actions create a maintainable trail that is suitable for pedestrians and stock.

Under this alternative the Mirror Lake Loop Trail would mostly be reconstructed in the existing corridor. The trail would be markedly improved to withstand higher than "normal" spring runoff from Tenaya Creek. The trail would be rebuilt suitable for stock use with a trail width of 7 to 8.5 feet wide; (8.5 feet is the existing trail width in most sections). Refer to project map (p. 8) and the section by section table (p.13-15) for a detailed description of the proposed action.

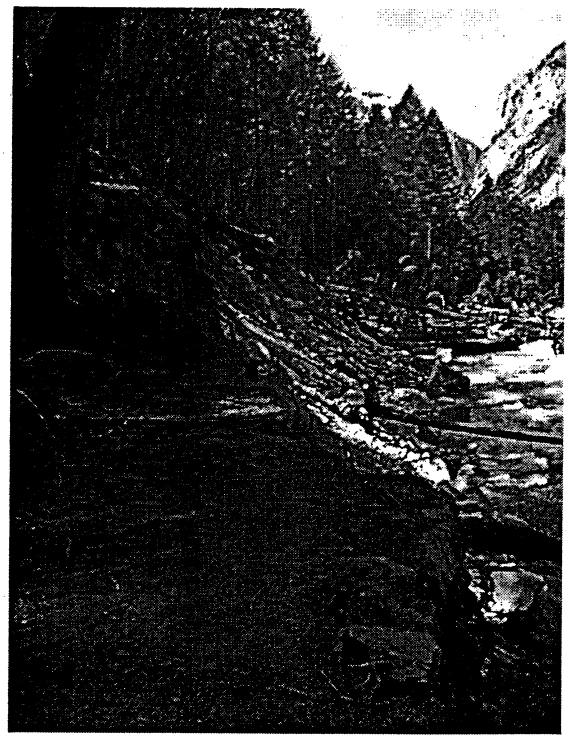
Two sections of the loop require reroutes under No Action and the Proposed Action. Section K was completely eroded and washed away (see photo p. 10) necessitating a 1,450 foot reroute and approximately 640 feet of Section P would be constructed away from the newly expanded Tenaya Creek channel.

The upper Tenaya Creek Bridge #25 (Section L) would be replaced as described in No Action. The lower Tenaya Creek Bridge #24 would not be replaced; wayfinding signs would be placed to direct trail users to the Tenaya Creek road bridge as described in No Action. The Snow Creek Bridge #26 (Section O) would be reconstructed along a newly rerouted trail Section P. The old Snow Creek Bridge would be removed and the area restored to natural conditions.

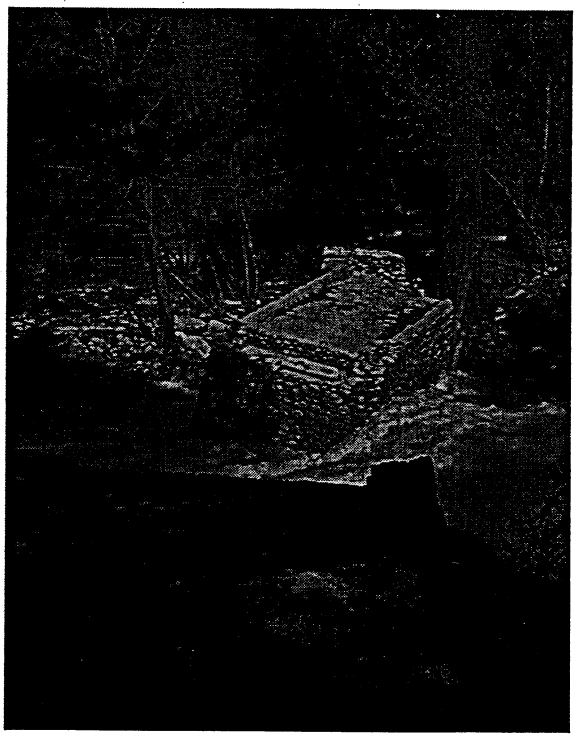
To prevent trail washouts, in sections of walled causeways keystones (large, well-anchored rocks) would be laid perpendicular to or across the trail tread. The keystones or series of keystones would hold or retain the fill in the trail tread by directing flowing water off the trail to prevent erosion.

Trail construction techniques include the following definitions and prescriptions:

- Base material - This consists of four inch and larger granite rocks used as fill between the trail's edges. A surface consisting of an aggregate of finer materials caps the base to provide a walking surface or trail tread. This construction allows water to flow through the trail, leaving the tread dry.
- Trail tread - This refers to an aggregate of finer materials that makes up the surface of the trail.
- Causeway - An elevated section of trail built over a wet or eroded section. May be walled or wall-less construction.
- Walled causeway construction - Trail corridor raised above surrounding grade, margins are constructed of stone tiers to keep base material confined. This type construction would be used in areas requiring a more substantial structure to stand up to local conditions.
- Keystones - Large, well-anchored rocks used in walled causeway construction. These rocks are placed to retain the fill in the trail tread by directing flowing water off the trail to prevent erosion.
- Wall-less causeway construction - Trail corridor raised above surrounding grade, the margins are crushed rock. This type of construction would be used in areas requiring a less substantial structure to stand up to local conditions.



Trail Damage Section K



Abutment Damage Section L

4.2.1 Mitigation Measures of the Proposed Action: Mitigation measures have been developed to reduce the anticipated environmental effects of the proposed action.

Temporary impacts associated with trail construction would occur, such as soil and vegetation disturbance and the possibility of soil erosion into Tenaya Creek. Standard erosion control and prevention measures such as silt fences and sand bags could also be used to minimize any potential soil erosion.

Following soil disturbance, areas would be monitored for non-native species (especially blackberry and bull thistle) which would be removed.

Erosion control devices would be inspected weekly or after every major storm. Accumulated sediments would be removed when necessary. Silt removal would be accomplished in such a way as to avoid introduction into any wetlands or flowing water bodies.

Prior to trail construction, Resource Management Staff will work with the Trail Crew Leader to identify and initiate plant salvage to be used as revegetation material once trail construction is complete. Revegetation efforts would be to recreate the natural spacing, abundance, and diversity of native plant species. During project implementation and upon completion of the project a Natural Resource Specialist from the Office of Flood Recovery will inspect the area to assess ongoing and completed revegetation and restoration efforts.

If previously undiscovered cultural resources are found, every effort would be made to avoid these newly discovered resources. Should avoidance prove impossible, data recovery measures would be initiated using the approved Yosemite Archeological Synthesis and Research Design, and the Recovery Archaeologist would consult with the American Indian Council of Mariposa County.

The use of a "Bobcat" (small front end loader) would be allowed in the construction area. It is possible that petrochemicals from this equipment could seep into the soil and water. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks and each machine would have a clean up and spill containment kit on board. Also the undercarriage would be inspected and cleaned as necessary to prevent importing non-native plant materials.

All blasting would conform with the 1991 NPS-65 (*Explosives Use and Blasting Program*) specifications. All blasting would use the minimum amount necessary to accomplish the task.

The U.S. Army Corps of Engineers (COE, Sacramento, California) has been consulted (December 23, 1997) regarding work on both Tenaya Creek Bridges.

For the upper Tenaya Creek Bridge #25 the project proposal consists of removing and rebuilding the north abutment and rebuilding the bridge to repair the bridge to pre-flood conditions. The rebuilt north abutment would not be in the channel. The work to reconstruct the upper Tenaya Creek Bridge requires citation of COE Nationwide Permit #3 *Maintenance*. Work to relocate the Snow Creek Bridge #26 also falls under this permit.

If the trail is rebuilt in the exact location, reconstruction of the Mirror Lake Trail through the wetlands is authorized under COE Permit section 323.4, Discharges Not Requiring Permits, 33 CFR, Federal Register, November 13, 1986 (Larry Vinzant, Chief, San Joaquin Valley Office, COE, Sacramento, CA March 4, 1998). Mr. Vinzant stated that examination of the area under high water conditions was a valid determination to make an exemption from the one-year rule under which the regulations are usually valid. Mr. Vinzant stated that 323.4 emphasized rebuilding in same location with "minor modification" to elevation and location and that adding a "few" culverts to facilitate drainage and protect the trail and its investment would be within the regulations of 323.4.

For the lower Tenaya Creek Bridge #24, the remains of the bridge abutments would be removed. All mechanical work to remove the damaged abutments would be conducted from the creek banks and during times of low flow. No equipment would be allowed below the ordinary high water mark or in the creek itself.

This project also requires compliance with General Condition 9 (water quality, Section 401 of the Clean Water Act) of the COE Nationwide Permit process. Clean Water Act section 401 certification or waiver of certification will be obtained through the California Regional Water Quality Control Board prior to construction.

All permits would be obtained prior to work on the Tenaya Creek Bridges.

Throughout all aspects of the project, Tenaya and Snow Creek water quality would be maintained at or above minimum levels required by the State of California Water Quality Control Board.

4.2.2 Staging Area: The staging area for equipment and material storage would be on the Mirror Lake access road and shoulder.

4.2.3 General Construction Schedule: Construction for this project is expected to start about October 1998. The trail is expected to be finished by winter 2000, however, construction could be delayed by weather conditions or unforeseen events.

ALTERNATIVE COMPARISON TABLE

Area	Length	No Action – Existing Conditions	Proposed Action
A	150 feet	one tier causeway 10 to 12 inches above grade	walled causeway, 24 inches above grade , up to two 18 inch culverts installed to improve drainage under the trail
B	166 feet	one tier causeway 10 to 12 inches above grade	walled causeway 24 inches above grade with up to three 18 inch culverts installed under the trail, north side drainage would be re-established to direct flow away from trail
C	390 feet	wall-less causeway	causeway walled only on the north side to protect the trail from erosion by flowing water
D	81 feet	restore trail which is heavily silted from flood deposition	wall-less causeway, flood deposited sand would be cleared from trail and reused in other trail sections
E	304 feet	wall-less causeway	existing drainage on either side of the trail would be re-established, water flows down the trail during times of rain and snow melt, step-through rock fords would be installed at grade to improve drainage across and down the trail
F	83 feet	restore trail although trail is especially vulnerable to water on the trail, Tenaya Creek cut a new channel where the trail was	retaining wall approximately 24 inches above grade, consisting of two or three stone tiers, paralleling the bank and following the contour of the slope to support the trail, this minor reroute involves removing four cedar trees less than 12 inch diameter
G	179 feet	walled causeway	walled causeway 24 inches high, install up to two 18 inch culverts to improve drainage
H	175 feet	wall-less causeway	wall-less causeway, remove a small number of downed trees, and re-establish drainages on either side of the trail to move water off the trail
I	65 feet	wall-less causeway	wall-less causeway construction, drainage repairs to both sides of the trail
J	73 feet	existing trail with wall-less construction would remain	minor maintenance involving the clearing of downed logs and returning the trail to grade by removing flood deposited sand from the trail surface; the removed sand would be reused in other trail sections.

ALTERNATIVE COMPARISON TABLE (continued)

Area	Length	No Action – Existing Conditions	Proposed Action
K	1450 feet	same as Proposed Action	New trail construction: The trail segment would follow the route of least resistance, avoiding large trees and rocks and taking advantage of the existing grade whenever possible; some of the trail segments would follow the newly established social trail. The new approximate 7-foot wide trail segment would be a combination of walled and wall-less causeway on one side of the trail; construction would depend on changing site conditions. Four armored drainage crossings (fords) would be constructed to cross drainages that flow only during times of rain and snow melt. Armor would be necessary to prevent trail damage during times of higher flow. Reroute would involve the removal of approximately 30 cedar and fir trees less than 12 inches diameter at breast height (dbh), one white fir greater than 12 inches dbh, and 5 black oaks less than 12 inches dbh.
L	70 feet	same as Proposed Action	Reconstruction of the upper Tenaya Creek Bridge #25: the south abutment re-used; the north abutment relocated and reconstructed, and the unusable abutment in the river would be blasted with controlled explosive charges and the materials reused as much as practicable. The approximate 70 foot long proposed bridge would be built of metal beams with treated wood decking and railings.
M	824 feet	restore trail at grade	standard repair consisting of restoring tread to grade where erosion has occurred, rebuild/repair drainage structures and removing downed trees
N	12 feet	same as Proposed Action	construct about 12 feet of new trail at the east approach to the Snow Creek Bridge #26 by clearing, grading, and installing base material to join the existing trail corridor to the proposed new bridge location

ALTERNATIVE COMPARISON TABLE (continued)

Area	Length	No Action – Existing Conditions	Proposed Action
O	46 feet	same as Proposed Action	Relocate the Snow Creek Bridge #26 (remove existing and construct a replacement): the relocated bridge would be approximately 46 feet long, the west approach deck would be about 40 inches above grade requiring a rock ramp/causeway approach, and the bridge would be slightly angled to take advantage of the existing trail corridor on the east side. The old Snow Creek Bridge #26 nearby would be removed, materials recycled, and the surrounding approach trails would be restored to natural conditions.
P	641 feet	same as Proposed Action	Reroute trail: the new trail segment would begin at the proposed replacement Snow Creek Bridge #26 and continue to the junction of the Snow Creek Trail and Mirror Lake Loop Trail. This section would contain rock armored fords constructed where the trail crosses streams that flow during times of rain and snow melt. The trail corridor would be approximately 8.5 feet wide and sections would be walled causeway where necessary to maintain consistency and protect the trail. This trail reroute would involve removing approximately 20 cedar and fir trees less than 12 inches dbh. The abandoned trail would be restored to natural conditions and asphalt would be removed or reused as fill in other sections.
Q	180 feet	maintenance as necessary to at grade trail which crosses through a seasonally wet low area that is expanding from people treading into the surrounding resources	wall-less causeway
R	60 feet	maintenance as necessary to the existing trail which is eroding from water coming off the hill that has cut a new channel	drainage improvement and trail rehabilitation in an eroded area, trail drainage would be adjusted to account for the new overland flow pattern
S	180 feet	maintenance as necessary to the trail which is damaged and rutted from water and equestrian use causing accelerated erosion	armor the trail surface by "paving" it with rock work (cobblestones), each stone would be approximately one cubic foot; the total distance the rock work would cover would be about 180 feet long by eight feet wide

4.3 Alternatives Considered and Dismissed

Several alternative trail routes and construction methods were considered. All were dismissed due to economic and/or environmental costs.

4.3.1 Talus Alternative: Approximately 3,620 feet of the south Mirror Lake Loop Trail would be rerouted. The proposed reroute would move the trail upslope, into the talus and out of wetlands and floodplain. The rerouted portion of the trail would be approximately six feet wide. The remains of the upper Tenaya Creek Bridge #25 would be removed and the bridge replaced as described in No Action and the Proposed Action. The Snow Creek Bridge and reroute would occur as previously described.

This alternative was dismissed for high economic and environmental costs. The considered route would be through undisturbed, north facing talus. The talus is steep in some areas and the trail would be more susceptible to rockfall and slides. This route would require extensive blasting and substantial trail construction.

4.3.2 Boardwalk Alternative: Approximately 2,500 feet of the 3,600 foot long trail to be reconstructed (Section A through I) would be an elevated wooden boardwalk on pilings. The remains of the upper Tenaya Creek Bridge #25 would be removed and the bridge replaced as described in No Action and the Proposed Action. The Snow Creek Bridge and reroute would occur as previously described.

The wooden boardwalk was dismissed because it is not an acceptable trail surface for stock use. The Yosemite Trails program does not support the use of boardwalks on routes heavily used by horses. This type of trail construction would require regular, costly and substantial maintenance (including the periodic use of wood preservatives) to keep the route safe for stock and pedestrian use.

4.3.3 Trail Removal Alternative: The south side of the Mirror Lake Loop Trail would not be restored and a small portion of the former trail would be returned to natural conditions. Although signs currently indicate this portion of the trail as closed, foot traffic has developed a social trail, this most likely would persist. Maintenance would continue on the north side of the Mirror Lake Loop Trail which currently accommodates both stock and pedestrian use. The remains of the upper Tenaya Creek Bridge #25 would be removed but not replaced. The Snow Creek Bridge and reroute would occur as previously described.

This alternative is not consistent with current management objectives or approved management plans (1980 GMP, 1992 Concession Services Plan, and 1998 Draft VIP). The Trail Removal Alternative is a management decision outside the scope of this document.

5.0 AFFECTED ENVIRONMENT

The significance of Yosemite National Park is derived from its diverse biological, geological, wilderness, and scenic resources in combination with its cultural heritage. Yosemite Valley and the Mariposa Big Tree Grove of giant sequoias have the distinction of being the first scenic natural areas to be set aside by a national government for public benefit and appreciation.

Yosemite is an outstanding example of the major stages of the earth's evolutionary history, containing a combination of high peaks, sheer cliffs, massive granite domes, magnificent waterfalls, expansive wilderness, and giant sequoias. Yosemite Valley, a unique natural feature, contains many of the world's highest known waterfalls as well as El Capitan, Half Dome and Mount Watkins, three of the largest exposed monoliths of granite in the world.

Detailed information for Yosemite National Park and Yosemite Valley may be found in the 1980 *General Management Plan*, the 1996 *Resource Management Plan, Yosemite National Park*, and the 1997 *Draft Valley Implementation Plan and Supplemental Environmental Impact Statement, Yosemite National Park (VIP), and the Mirror Lake Environmental Assessment 1996*. A summary of the resources associated with this project follows.

Project Location: Yosemite National Park is in the central Sierra Nevada, a mountain range which stretches one-third the length of California. The 747,956-acre, 1,169-square mile park, lies 150 miles east of San Francisco. The park includes portions of Tuolumne, Mariposa, and Madera counties and is bounded on all sides by national forest lands: the Stanislaus to the northwest; the Toiyabe to the northeast; the Inyo to the southeast; and the Sierra to the southwest.

Mirror Lake is located at the east end of Yosemite Valley in lower Tenaya Canyon at an elevation of approximately 4,000 feet. It is about a mile upstream from the confluence of Tenaya Creek and the Merced River.

General land use plans have set the project area aside for recreation and as a landscape viewing area. The GMP has designated Mirror Lake as a Natural Environment Subzone. Within this subzone, roads, picnic areas, and trailheads are permitted, but development is minimal.

5.1 Biotic Communities

Annual Flow Measurements of Tenaya Creek at Tenaya Creek Road Bridge, 1950 Measurements	
Month	cu/ft/sec
Aug-Nov	1-2
Dec	5
Jan	25
Feb	40
March	50
April	250
May	550
June	250
July	40
Highest flow recorded during the period of gage recording: 5150 cu/ft/sec, Nov. 18, 1951	

5.1.1 Tenaya Creek: Waters found in the Tenaya Creek watershed are considered to be pristine and largely undisturbed. The watershed is sediment laden and granitic sand is mobilized during spring runoff and periods of intense thunderstorms. The creek is primarily a flash flood drainage and the peak water runoff occurs from snow melt between April and June (see table to left). It is not uncommon for the seasonal water discharge of the creek to diminish entirely during mid-to-late summer months (August through November); these are periods when surface water is mostly absent in the creek except for isolated deep still pools. The flow recording station was closed in the early 1950s. The average annual average flow of Tenaya Creek in 1950 was recorded at about 101.3 cubic feet per second.

5.1.2 Soil: Soil types found in the Mirror Lake floodplain consists of El Capitan fine sandy loam with Miwok complex on the upland fringe. The El Capitan fine sandy loam is a coarse textured stream alluvium from granitic rocks and reworked lake sediments. The area experiences occasional flooding and is likely to be scoured and recharged with fresh sediments after periods of high flows. Colluvial (talus) slopes comprise the deposits found above the floodplain. Stones and boulders over 10 inches in diameter predominate the gravel size fragments found in the upper portions of the project area.

5.1.3 Vegetation: The Mirror Lake and Tenaya Canyon habitat includes a diversity of vegetation species common to transition areas found between the ecotones of several plant communities, ranging from woodland to riparian. Depending on conditions, the vegetative species that may be found throughout the project area are: black cottonwood (*Populus trichocarpa*), big leaf maple (*Acer macrophyllum*), white alder (*Alnus rhombifolia*), Mountain Dogwood (*Cornus nuttallii*), sedges (*Carex* spp.), rushes (*Juncus* sp.), horsetail (*Equisetum arvense*), grasses, ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), incense-cedar (*Calocedrus decurrens*), douglas-fir (*Pseudotsuga menziesii*), California bay-laurel (*Umbellularia californica*) California black oak (*Quercus kelloggii*), coffeeberry (*Rhamnus californica*), greenleaf manzanita (*Arctostaphylos patula*), snowberry (*Symphoricarpos acutus*), wild ginger (*Asarum hartwegii*), ferns,

native berries (*Ribes* spp., *Rubus* spp.), interior live oak (*Quercus wislizenii*), canyon live oak (*Quercus chrysolepis*), lupine (*Lupinus* spp.), popcorn-flower (*Plagiobothrys* sp.), woodland star (*Lithophragma* spp.), and white yarrow (*Achillea lanulosa*).

5.1.4 Wildlife: The Mirror Lake area and Tenaya Canyon support populations of common animals and includes deer (*Odocoileus hemionus*), bobcat (*Lynx rufus*), black bear (*Ursus americanus*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), mountain lion (*Felis concolor*), spotted bat (*Euderma maculatum*), western mastiff bat (*Eumops perotis*), northern goshawk (*Accipiter gentilis*), blue grouse (*Dendragapus obscurus*), northern pygmy owl (*Glaucidium gnoma*), white-headed woodpecker (*Picoides albolarvatus*), pileated woodpecker (*Dryocopus pileatus*), olive-sided flycatcher (*Contopus borealis*), mountain chickadee (*Parus gambeli*), red-breasted nuthatch (*Sitta canadensis*), spotted oul *Strix occidentalis, occidentalis*), Cooper's hawk (*Accipiter cooperii*), western fence lizard (*Sceloporus occidentalis*), sagebrush lizard (*Sceloporus graciosus*), southern alligator lizard (*Gerrhonotus multicarinatus*), Gilbert's skink (*Eumeces gilberti*), western toad (*Bufo boreas*), red-legged frog (*Rana aurora draytoni*), and the foothill yellow-legged frog (*Rana boylii*).

5.2 Wetlands

Executive Order 11990 ("Protection of Wetlands") requires the NPS and other agencies to evaluate the likely impacts of actions in wetlands. According to the "Classification of Wetlands and Deepwater Habitats of the United States" mapping system by Cowardin et al., USFWS FWS/Obs-79/31 December 1979, the existing Mirror Lake trail avoids jurisdictional wetlands. Reconstructing the Mirror Lake trail in its existing location would be exempt from compliance with Executive Order 11990 ("Protection of Wetlands") and a Statement Of Findings (SOF) would not be prepared.

Reconstructing the Mirror Lake trail in its existing location is an "excepted" action described in the draft NPS Procedural Manual #77.1: Wetland Protection, section 4.2.A.1.a, which states "Scenic overlooks and foot/bike trails or boardwalks, including signs, the primary purposes of which are public education, interpretation, or enjoyment of wetland resources".

No Action and the Proposed Action reconstructs the damaged trail sections in their original alignment. Portions of the original trail alignment are bordered on either side by wetlands. However, the trail footprint itself is not considered wetlands. Either alternative creates some short term impacts to wetlands mostly due to trampling as trail crews rebuild trail sections that bisect wetland areas. Wetlands will be addressed as an impact topic in this document.

5.3 Special Status Species (Threatened, Endangered, Proposed and Rare Species)

In letters dated August 27, 1997 (USFWS Reference No. 1-1-97-SP-1976) the US Fish and Wildlife Service lists 33 special status species that may reside in or depend on the project area as critical habitat.

Using the August 27, 1997, USFWS list of special status species that may occur within the project area, park staff conducted a special status species survey of the project area during September 1997. No evidence of any listed species was found. However, a nest of the California spotted owl (*Strix occidentalis occidentalis*) is known to be near the damaged trail section. The California spotted owl is a USFWS bird, "Species of Concern". Additionally, during the survey a Cooper's hawk (*Accipiter cooperii*) nest was discovered near the damaged trail section. The Cooper's hawk is listed by the state of California as a "Species of Special Concern". Special status species will be discussed as an impact topic.

5.4 Park Operations

Park operations would be affected by reconstructing the trail in its original pre-flood alignment. Annual, substantial trail maintenance and enforcement of trail closure would be affected. Park operations will be addressed as an impact topic in this document.

6.0 ENVIRONMENTAL CONSEQUENCES

This section describes the environmental consequences associated with No Action and the Proposed Action. It is organized by Impact Topics, which distill the issues and concerns into distinct topics for discussion analysis. These topics focus on the presentation of environmental consequences, and allow a standardized comparison between alternatives based on the most relevant topics.

6.1 Alternative A - No Action

6.1.1 Biotic Communities: There would be no major adverse impacts to biotic communities. Abutments would be removed and/or constructed during low flow periods to minimize impacts to Tenaya and Snow Creeks. Trail reroutes would not cause any significant long-term impacts. Minor impacts from annual routine maintenance would continue to occur.

Damaged trail Sections A - I, M, N and Q - S would receive minor spot repairs, the trail would be repaired in its existing alignment with the exception of two reroutes. These reroutes, Sections K and P, would be out of any wetland area. The trail would be located along existing contours, avoiding large trees and rocks. Approximately 50 trees would be removed for both reroutes, but most of these trees are less than twelve inches in diameter. The designated wilderness area located approximately 100 feet from the project area would be avoided.

The upper Tenaya Creek Bridge abutment to be removed is constructed of river cobble held together by masonry around the periphery. Removing the bridge abutment of the upper Tenaya Creek Bridge would require blasting. The shattered abutment would drop into Tenaya Creek essentially returning cobbles to the creek bed. These materials would be reused as much as practicable in construction of the new abutment. Smaller pieces of the blasted abutment remaining in the channel would eventually break up due to the freezing, thawing and flow of the creek channel. Over time, the channel would return to a condition similar to that before the bridge was constructed.

Overall, removing the remaining portions of damaged abutments and rebuilding the upper Tenaya Creek Bridge in its present location would present little impact to biotic communities, the water quality of Tenaya Creek, or the creek itself. To minimize impacts to the creek, removal of the upper and lower Tenaya Creek Bridge abutments would occur during low flow periods. A reconstructed (longer) upper Tenaya Creek Bridge would increase the span allowing a higher volume of water to flow under the Tenaya Creek bridge during highwater events.

The effects to wildlife would be minimal. There would be a short-term noise impact to wildlife from the helicopter used to haul in stringers for bridge construction.

Human activity, blasting, and noise associated with trail relocation would disturb animals in the immediate vicinity of the construction zone. Dates when blasting is permitted have been established to minimize the effects on nesting birds. Mobile animals intolerant of disturbance would temporarily abandon sites during construction. Some less mobile animals and invertebrates would be expected to be lost during soil disturbing activities. Since the trail has been in use over the years, animals in the vicinity of the trail have been acclimated to human activity and the use associated with the rerouted trail segments is not expected to create an appreciable adverse impact to wildlife.

6.1.2 Wetlands: Since the trail would essentially be repaired in its existing alignment, and the two reroutes would not occur in wetland areas, there would be no new impacts to wetlands. Current adverse impacts to wetlands would continue. These impacts occur during spring runoff (primarily during April and May) when users deviate from the trail to avoid saturated areas.

The trail has historically been bordered by wetlands. Approximately 1,850 feet of existing trail would be repaired through these areas. The repaired trail would vary from six to eight and a half feet wide. Construction equipment would not travel out of the construction zone and impacts to trailside vegetation from equipment and trail crew would be short term.

In wetland areas, excavated material would be stockpiled. To protect nearby vegetation, sparsely vegetated areas would be chosen for stockpiling. A large tarp could be laid down and covered with plywood; excavated material would be stockpiled on the plywood and tarp. The excavated material would be used in trail construction. Once construction is complete, the effected vegetation would be monitored and, if necessary, recovery efforts would be initiated should any portions of the vegetation fail to recover naturally.

6.1.3 Special Status Species (Threatened, Endangered, Proposed and Rare Species): There would be no adverse impacts to special status species. Implementing blasting restrictions reduces short-term seasonal impacts to the species mentioned below. The majority of project blasting would occur at the eastern extent of the project area. There are no anticipated long-term impacts to special status species associated with this project.

In letters dated August 27, 1997 (USFWS Reference No. 1-1-97-SP-1976) the U.S. Fish and Wildlife Service lists 33 special status species that may reside in or depend on the project area as critical habitat. Park staff conducted a special status species survey of the project area during September 1997. No evidence of any federally listed species was found. However, a nest of the California spotted owl (*Strix occidentalis occidentalis*) is known to be near the damaged trail section. The California spotted owl is a USFWS bird, "Species of Concern". Additionally, during

the survey a Cooper's hawk (*Accipiter cooperii*) nest was discovered near the damaged trail section. Cooper's hawk is listed by the state of California as a "Species of Special Concern".

The California spotted owl nest is approximately 160 feet away from the original trail alignment. The Cooper's hawk nest is approximately 70 feet away from the original trail alignment. The owl nest was last documented as active in 1992 and the Cooper's hawk nest was last documented as active in 1996. To avoid disturbing potential nesting and foraging activities of the California spotted owl and Cooper's hawk pairs, no blasting or drilling would occur between December 19th and August 2nd. By restricting drilling and blasting between August 2nd and December 19th, impacts to nesting and foraging activities would be minimized. Additionally, construction workers and supervisors would be informed about these special status species.

6.1.4 Park Operations: The reconstructed trail section would continue to be susceptible to closures, damage and destruction from annual runoff. Park staff would be expected to reconstruct and repair these trail sections on an annual basis. Protection rangers would be needed to enforce annual closures during trail saturation.

By reconstructing the damaged trail section in its existing alignment without elevation and drainage improvements, trail Sections A through I would continue to be susceptible to damage from annual spring runoff. The Trails Office Staff would be expected to make substantial reconstruction repairs to trail sections on an annual basis. This impacts staff hours and the overall park budget. The Mirror Lake Loop Trail would be closed to stock and pedestrian traffic for much of the wet season; persons attempting to walk the closed trail would cause additional resource damage by leaving the established corridor to find dry routes. Protection rangers would continue to be needed; however, enforcement of closures would be difficult to maintain, further impacting resources.

6.2 Alternative B - Proposed Action

6.2.1 Biotic Communities: There would be no major adverse impacts to biotic communities. Abutments would be removed and/or constructed during low flow periods to minimize impacts to Tenaya and Snow Creeks. Trail reroutes would not cause any significant long-term impacts. Minor impacts from annual routine maintenance would continue to occur, but these impacts would be less than would occur under No Action. There would be short-term impacts to vegetation associated with the gathering of rock in the project area to supplement materials hauled in for construction.

The short-term impacts to vegetation associated with the Proposed Action would

be greater than those associated with No Action; however, the cumulative impacts to vegetation over time would be less under the Proposed Action due to the decreased chance of trail saturation and the reduced need for annual trail maintenance. The extent of the project area would be similar for both alternatives since the damaged trail Sections A - I, M, N and Q - S would be improved in its existing alignment and the reroutes are the same that would occur under No Action. As described in No Action, these reroutes (Sections K and P) would be out of any wetland area; would be located along existing contours, avoiding large trees and rocks; and would involve removing approximately 50 small trees. The designated wilderness area located approximately 100 feet from the project area would be avoided.

The upper Tenaya Creek Bridge abutment removal and reconstruction and the Snow Creek Bridge removal and relocation would have the same impacts as described for No Action. The effects to wildlife would be minimal and are the same as described for No Action.

6.2.2 Wetlands: Since the trail would essentially be improved in its existing alignment, and the two reroutes would not occur in wetland areas, there would be no new impacts to wetlands. Current adverse impacts to wetlands would be minimized. These impacts occur during spring runoff (primarily during April and May) when users deviate from the trail to avoid saturated areas. Due to improvements and the resulting decreased chance of saturation, trail traffic and associated impacts would more likely be contained within trail boundaries (preventing impacts to adjoining wetlands). It is anticipated that an improved trail will seldom need to be closed due to saturation.

The trail has historically been bordered by wetlands. Approximately 1,850 feet of existing trail would be improved through these areas. Similar to No Action, the improved trail would vary from six to eight and a half feet wide. Construction equipment would not travel out of the construction zone and impacts to trailside vegetation from equipment and trail crew would be short term. As described in No Action, excavated material would be stockpiled for construction use and once construction is complete, the effected vegetation would be monitored and, if necessary, recovery efforts would be initiated should any portions of the vegetation fail to recover naturally.

6.2.3 Special Status Species (Threatened, Endangered, Proposed and Rare Species): As described in No Action, there would be no adverse impacts to special status species. Implementing blasting restrictions reduces short-term seasonal impacts to the species mentioned below. The majority of project blasting would occur at the eastern extent of the project area. There are no anticipated long-term impacts to special status species associated with this project.

6.2.4 Park Operations: The improved trail section would not be as susceptible to closures, damage and destruction from annual runoff. Therefore, park staff would not have to annually reconstruct and repair trail sections. Additionally, it would be less likely that the trail would be closed due to saturated conditions. Protection rangers would not have to enforce annual closures, and therefore, could spend time protecting other park resources.

By reconstructing the damaged trail sections with an elevated causeway using walled causeway design where necessary and improving drainage through and around the trail, the trail crew would not be required to rebuild these trail sections after annual spring runoff. Park operations would consist of routine trail maintenance and there would seldom be a need for the Protection Division to enforce annual trail closures. Savings of staff time and reconstruction dollars would be realized.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES		
Impacts to	**Alternative A No Action**	**Alternative B Proposed Action**
Biotic Communities	There would be no major adverse impacts to biotic communities. Abutments would be removed and/or constructed during low flow periods to minimize impacts to Tenaya and Snow Creeks. Trail reroutes would not cause any significant long-term impacts. Minor impacts from annual routine maintenance would continue to occur. The effects to wildlife would be minimal.	There would be no major adverse impacts to biotic communities. Abutments would be removed and/or constructed during low flow periods to minimize impacts to Tenaya and Snow Creeks. Trail reroutes would not cause any significant long-term impacts. Minor impacts from annual routine maintenance would continue to occur, but these impacts would be less than would occur under No Action. There would be short-term impacts to vegetation associated with the gathering of rock in the project area to supplement materials hauled in for construction.
Wetlands	There would be no new impacts to wetlands. Current adverse impacts to wetlands would continue. Impacts to trailside vegetation from equipment and trail crew would be short term.	There would be no new impacts to wetlands. Current adverse impacts to wetlands would be minimized. Due to improvements and the resulting decreased chance of saturation, trail traffic and associated impacts would more likely be contained within trail boundaries (preventing impacts to adjoining wetlands). It is anticipated that an improved trail will seldom need to be closed due to saturation.
Special Status Species	There would be no adverse impacts to special status species. Implementing blasting restrictions reduces short-term seasonal impacts to the species mentioned below. The majority of project blasting would occur at the eastern extent of the project area.	As described in No Action, there would be no adverse impacts to special status species. Implementing blasting restrictions reduces short-term seasonal impacts to the species mentioned below. The majority of project blasting would occur at the eastern extent of the project area. There are no anticipated long-term impacts to special status species associated with this project.
Park Operations	The reconstructed trail section would continue to be susceptible to closures, damage and destruction from annual runoff. Park staff would be expected to reconstruct and repair these trail sections on an annual basis. Protection rangers would be needed to enforce annual closures during trail saturation.	The improved trail section would not be as susceptible to closures, damage and destruction from annual runoff. Therefore, park staff would not have to annually reconstruct and repair trail sections. Additionally, it would be less likely that the trail would be closed due to saturated conditions. Protection rangers would not have to enforce annual closures, and therefore, could spend time protecting other park resources.

7.0 CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." (40 CFR 1508.7). Cumulative impacts have been considered for each alternative.

7.1 Alternative A - No Action

No Action would have a minor effect which would make an incremental contribution to an adverse cumulative impact on the environment of Yosemite in the areas of Wetlands and Park Operations.

Yosemite staff has identified the park's wetlands and meadows as the park's highest value resource. Current impacts to wetlands would continue in the Mirror Lake area. These impacts occur during spring runoff (primarily during April and May) when users deviate from the trail in search of dryer ground, inadvertently trampling wetland vegetation.

No Action would not meet ongoing and reasonably foreseeable future changes in park facilities, services, and use. Increases in visitation and the resulting congestion and adverse environmental impacts, especially in Yosemite Valley, have highlighted the need for improvements. Since the Mirror Lake Loop Trail is one of the only trails in Yosemite Valley suitable for all hiking abilities, closures degrade the visitor experience and concentrate impacts in other already over crowded areas. Additionally, No Action annually expends park resources (money and labor) which could be used to protect other park resources.

7.2 Alternative B - Proposed Action

The Proposed Action would not contribute incrementally to cause an overall adverse impact on the environment of Yosemite. Nor does the Proposed Action reflect a precedent-setting or policy decision, several of which would have an adverse effect. Rather, the Proposed Action would have a positive impact to the park in the areas of Wetlands and Park Operations.

Yosemite staff has identified the park's wetlands and meadows as the park's highest value resource. The Proposed Action would contribute to the overall efforts to protect wetlands by minimizing adverse impacts in the Mirror Lake area. These impacts occur during spring runoff (primarily during April and May) when users deviate from the trail to avoid saturated areas. Trail improvements would

decreased the chance of saturation, so impacts from trail traffic would be less likely to extend outside of trail boundaries (preventing impacts to adjoining wetlands).

The Proposed Action reflects the current needs of Yosemite and recent, ongoing, and reasonably foreseeable future changes in park facilities, services, and use. The Proposed Action is consistent with park operational goals to provide for visitor enjoyment and improve efficiency. The Mirror Lake Loop Trail is a relatively flat trail, one of the only trails in Yosemite Valley suitable for all hiking abilities. The visitor experience in Yosemite would benefit from an improved trail less susceptible to closure. Park resources would be better allocated because an improved trail would require less annual maintenance; therefore, park staff would be available to maintain and protect other park resources.

8.0 COMPLIANCE

This environmental assessment provides disclosure of the planning and decision-making process and potential environmental consequences of the alternatives. The analysis of environmental consequences was prepared on the basis of a need to adequately analyze and understand the consequences of the impacts related to the proposed park developments and to involve the public and other agencies in the decision-making process. In implementing this proposal, the NPS would comply with all applicable laws and executive orders, including the following:

8.1 NEPA: This EA was prepared in accordance with the regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500 et seq.) and in part 516 of the U.S. Department of the Interior's Departmental Manual (516 DM).

NEPA is the basic national charter for environmental protection; among other actions it calls for an examination of the impacts on the components of affected ecosystems. The 1980 GMP, 1988 NPS *Management Policies*, NPS-77 (*Natural Resources Management*), the 1996 *Resources Management Plan*, and the 1997 draft VIP among other NPS and park policies, provides general direction for the protection of the natural abundance and diversity of all the park's naturally occurring communities.

Various agencies have been contacted and consulted as part of this planning and environmental analysis effort. Appropriate federal, state and local agencies have been contacted for input, review and permitting in coordination with other legislative and executive requirements.

8.2 Air Quality: Clean Air Act, as amended (42 USC 7401 et seq.). Yosemite National Park is designated as a Class I clean air area. Maximum allowable increases (increments) of sulfur dioxide (SO_2), particulate matter (TSP), and nitrogen oxides (NO_x) beyond baseline concentrations established for Class I areas cannot be exceeded. Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations.

8.3 Special Status Species: Endangered Species Act of 1973, as amended (16 USC 1531 et seq.). Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. No listed special status species or critical habitats would be impacted by the proposal. Consultation with the U.S. Fish and Wildlife Service would again be conducted before construction to ensure that no newly listed species have been found on site.

8.4 Wetlands and Floodplains: Executive Orders 11988 ("Floodplain Management") and 11990 (Protection of Wetlands") require an examination of impacts to floodplains and wetlands; of potential risk involved in placing facilities within floodplains, and protecting wetlands. The 1988 NPS *Management Guidelines*, NPS-2 (*Planning Guidelines*), NPS-12 (*National Environmental Policy Act Guidelines*), the 1980 GMP, and the 1997 draft VIP provide guidelines on developments proposed in wetlands and floodplains.

Executive Order 11990, "Protection of Wetlands," requires federal agencies to avoid, where possible, impacts on wetlands. If required, a Statement Of Findings would address any concerns for wetlands and also any permitting actions required under section 104 of the Clean Water Act and any state requirements.

Executive Order 11988, "Floodplain Management," requires all federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. Certain construction within a 100-year floodplain requires that a Statement Of Findings be prepared and accompany a Finding Of No Significant Impact. The trail is designed for day use and not intended for overnight occupation. In compliance with the NPS *Floodplain Management Guideline* (1993, V, B Excepted Actions) development of this trail is exempt from Executive Order 11988 (Floodplain Management). Therefore, no Statement Of Findings will be prepared.

8.5 Water Quality: Section 404 of the Clean Water Act (33 USC 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 401 et seq.) - The U.S. Army Corps of Engineers issues permits for work affecting navigable waters and wetlands of the U.S. All permits for both bridges would be obtained prior to work on the Tenaya and Snow Creek Bridges.

8.6 Cultural Resources: The NPS is mandated to preserve and protect its cultural resources through the organic act of August 25, 1916, and through specific legislation such as the Antiquities Act of 1906, the National Environmental Policy Act of 1969 (as amended), and the National Historic Preservation Act of 1966, NPS *Management Policies*, the *Cultural Resources Management Guideline* (NPS 28), and the Advisory Council on Historic Preservation's implementing regulations regarding Protection of Historic Properties (36 CFR 800). Other relevant policy directives and legislation are detailed in NPS 28.

Section 106 of the National Historic Preservation Act of 1966 requires that federal agencies having direct or indirect jurisdiction over undertakings consider the effect of those undertakings on properties on or eligible for listing on the national register and afford the Advisory Council on Historic Preservation and the state historic preservation office an opportunity to comment.

The 1992 amendments to the National Historic Preservation Act and the Archeological Resources Protection Act provide means whereby information about the character, location, or ownership of archeological sites, historic properties, and ethnographic sites, including traditional and cultural sites, might be withheld from public disclosure. This provision is especially important in cases where disclosure could risk harm to the resource or impede the use of a traditional site by practitioners.

The NPS would conduct research and subsurface surveys to identify any resources in the area of effect. Should buried deposits be located, or should impacts to previously identified sites be unavoidable, data recovery excavations would be undertaken. These subsurface survey and data recovery efforts would be guided by a project-specific research design. Representatives of culturally affiliated Indian groups, the American Indian Council of Mariposa County, Inc., and the Mono Lake Indian community would be closely involved in these efforts. The American Indian Council of Mariposa County has requested, additionally, that the NPS begin consultations under the Native American Graves Protection and Repatriation Act in the event that buried human remains are discovered during archeological excavations or project development.

9.0 SELECTED REFERENCES

Executive Orders
Executive Order 11988 (Floodplain Management)
Executive Order 11990 (Protection of Wetlands)
Executive Order 12898 (Environmental Justice)

National Park Service, U.S. Department of the Interior
DO-2 (*Planning Process Guidelines*)
NPS-12 (*NEPA Guidelines*)
NPS-28 (*Cultural Resource Management*)
NPS-65 (*Explosives Use and Blasting Program*)
NPS-77 (*Natural Resources Management*)

1916 NPS Organic Act
1980 *General Management Plan/Environmental Impact Statement, Yosemite National Park* (GMP)
1988 NPS *Management Policies*
1996 Mirror Lake Restoration EA
1996 *Resource Management Plan, Yosemite National Park*
1997 *Detailed Assessment Report, Yosemite National Park, Highwater 97A*, March 1, 1997.
1997 Cultural Landscape Study for Mirror Lake. Caputo, Jane. Manuscript on file, USDI National Park Service, Yosemite Archeology Office, El Portal, California.
1998 *Draft Valley Implementation Plan and Supplemental Environmental Impact Statement, Yosemite National Park* (VIP)
1998 Subsurface Survey at Site CA-MPR-1356. Vittands, John. Manuscript on file, USDI National Park Service, Yosemite Archeology Office, El Portal, California.
1998 *Draft NPS Procedural Manual #7.1: Wetland Protection*

U.S. Federal Government
1864 Act of Congress (13 Stat. 325)
1890 Act of Congress (26 Stat. 650)
1906 Joint Resolution of Congress (34 Stat. 831)
1955 Federal Air Quality Law
1963 Clean Air Act, as amended
1964 Wilderness Act
1966 National Historic Preservation Act
1968 The Architectural Barriers Act (P.L. 90-480)
1969 National Environmental Policy Act (NEPA)
1973 The Rehabilitation Act (P.L. 93-112)
1973 Endangered Species Act, as amended
1977 Clean Water Act
1984 California Wilderness Act
1984 Uniform Federal Accessibility Standards (49 CFR 31528)
1990 Native American Graves Protection and Repatriation Act
36 CFR 800.11 40 CFR, Part 503

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